APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,437	03/31/2004	Kirti Srivastava	4062-115	3807

23117	7590	12/29/2005

NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER
CHERRY, STEPHEN J

ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 October 2005</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: figures 2-7

are not described in the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-7 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. The claim merely recites an algorithm and

manipulates abstract ideas; therefore, it is non-statutory. Although the claims recite

providing inputs, which might be interpreted as manipulation of data representing

physical objects by a computer (see MPEP 2106 "Safe Harbors"), the specification does

not disclose that the method is carried out by a computer. Thus, the method claim is

interpreted as an algorithm being carried out by hand.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The claims recite "providing inputs" and "using said inputs". However, the specification as filed does not disclose providing these objects as "inputs". Although the drawings 2-7 depict what may be a window of a computer application, these figures are not described in the body of the specification, and are merely referred to as "plots" in the brief description of the drawings.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Research Note "A stochastic model to quantify the steady-state crustal geotherms subject to uncertainties in thermal conductivity" Kirti Srivastava and R.N. Singh Geophysical journal International (1999) Volume 138, pp. 895-899 (hereinafter Srivastava et al.).

With regard to claim 1 Srivastava et al. discloses a method for obtaining closed form

expressions for subsurface temperature depth distribution along with its error bounds

(see Summary) by using a stochastic heat conduction equation using selected boundary

condition (see column 3 line 28-31), incorporating random thermal conductivity (see

column 3 line 31-34), to obtain a mean and variance in temperature fields for a set of

boundary conditions (see column 3 line 34-37), the equation consisting of

$$D/dz \ (K(z) \ dT/dz) = -A(z) \quad \text{(see column 3 line 45 equation 1)}$$

where T is the temperature (°C) (see column 3 line 49), A(z) is the radiogenic heat

source (uW/m^3) (see column 3 line 50), $K(z) = K + K'(z)$ is the thermal conductivity

(w/m°C) (see column 4 line 3 equation 4), which is expressed as a sum of a

deterministic component and a random component (see column 4 line 1-5), K'(z) is the

random component with mean zero and a Gaussian colored noise correlation structure

represented by

$$E(K'(z)) = 0$$

$$E(\ K'(z_1) \ K'(z_2)\ ) = \sigma_K^2 e^{-\rho|z_1-z_2|} \sigma$$

(see column 4 line 5-10 equations 5 and 6), where

σ_K^2 is the variance in thermal conductivity (W/m °C)2

ρ is the correlation decay parameter z_1 and z_2 are depths (m) (see column 4 line 11-15).

With regard to claim 2, and applying the rejection of claim 1 above, Srivastava et al. discloses the boundary conditions consists of condition of heat sources and is selected from the group consisting of Zero ($A(z) = 0$), Constant ($A(z) = A$) and exponentially decreasing with depth (see column 1 line 8-11 & column 6 line 25-26).

With regard to claim 3 and applying the rejection of claim 1 above, Srivastava et al. discloses the boundary condition comprises constant surface temperature and constant surface heat flow (see column 1 line 8-11 & column 6 line 25-26).

With regard to claim 4, and applying the rejection of claim 1 above, Srivastava et al. discloses the boundary condition comprises constant surface temperature and constant basal heat flow (see column 1 line 8-11 & column 6 line 25-26).

With regard to claim 5, and applying the rejection of claim 1 above, Srivastava et al. discloses a parameter used is that of radiogenic heat generation (see column 3 line 50).

With regard to claim 6, and applying the rejection of claim 1 above, Srivastava et al. discloses the method is carried out electronically using a computing means with appropriate numerical values given for controlling thermal parameters, computing and plotting the mean and error bounds on the temperature depth distribution (see column 6 line 40-56 and Figures 1 and 2).

With regard to claim 7, and applying the rejection of claim 1 above, Srivastava et al.

discloses the subsurface is selected from an oil field, a natural gas field, tectonically

active area and a mineral resource area (see Summary & column 1 line 1-8 & column 3

line 1-5).

Response to Arguments

Applicant's arguments filed 9-13-2005 have been fully considered but they are

not persuasive. Applicant states that the Srivastava reference deals with only one

boundary condition and the claim recites multiple boundary conditions. However, the

recites the Markush group, "inputs selected from at least two different types of

boundary conditions involving at least three different heat sources"; thus, only one of the

boundary conditions and heat sources must be present to anticipate the claim language.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Stephen J. Cherry whose telephone number is (571)

272-2272. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

SJC
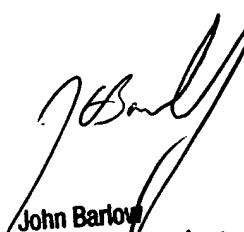
/John Barlow/
Supervisory Patent Examiner
Technology Center 2800